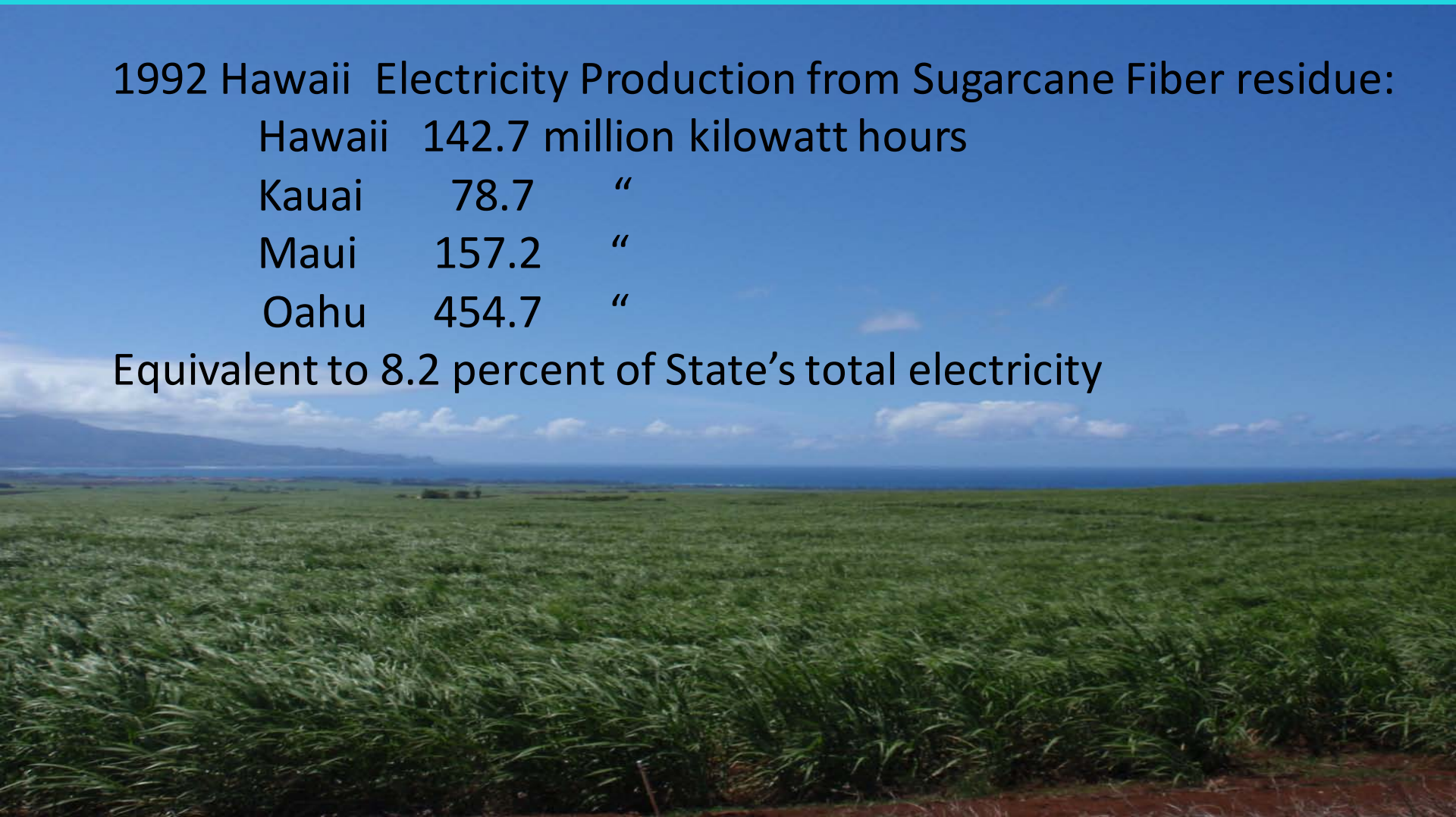
Biofuels and Hawaii Agriculture

Hawaii Agricultural Advanced Biofuels Opportunities
Research Questions and Planning Workshop

Mae Nakahata
Hawaii Farm Bureau Federation

Affordable biofuels ⇦ Affordable Feedstock



1992 Hawaii Electricity Production from Sugarcane Fiber residue:

Hawaii	142.7	million kilowatt hours
Kauai	78.7	“
Maui	157.2	“
Oahu	454.7	“

Equivalent to 8.2 percent of State’s total electricity

Farming inputs

- Land costs
- Reliable and Affordable Water
- Labor
- Fossil Fuel dependent Costs
  - Fuel
  - Fertilizer
  - Crop Protection Chemicals
  - Drip Irrigation supplies
  - Equipment

Agriculture of a different Scale

- Outside of Sugarcane and Pineapple and two of our larger farmers, a large farm is 25-50 acs
- Typical farms are 10-15 acres
- 55% of “farmers” do not list farming as primary income

Implications of an Island State

- Agriculture in Hawaii can be successful without entering food vs. fuel controversy
- Look to companies such as HC&S to take the lead for biofuels
- Agriculture can be user of co products

Biofuels – Reality Check

Liquid fuel w/o Conversion

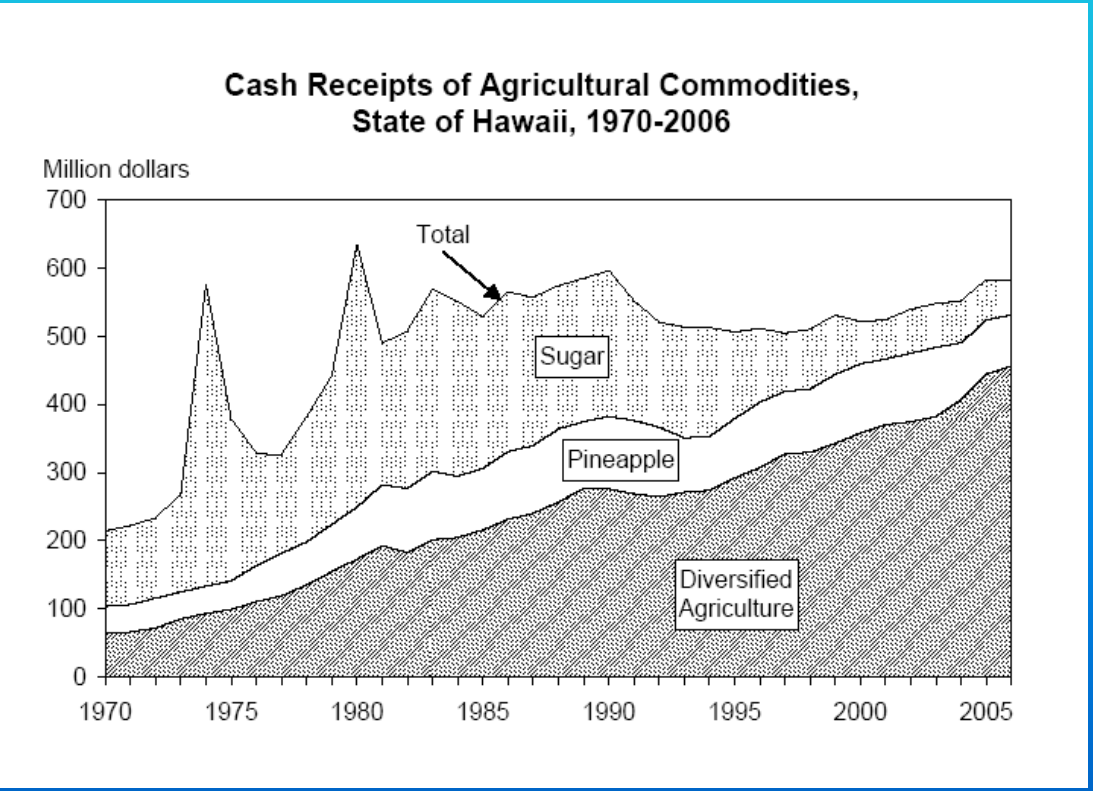
- $80/ barrel oil = 28 cents/ lb oil
- Assume 4 lbs of feed stock/lb oil
- Feedstock value = 7 cents/lb
- 28 cents feedstock = $320/barrel

What about Jatropha

- 100 lbs Jatropha = 1 gal diesel
- At $80/barrel = 2 cents/ pound for nuts
- 10 cents/lb nuts = $800/barrel

Farmers and Ranchers are Pragmatic

- How much will you pay for the feedstock?



Lure of Biofuels

- Jerry Ornellas, President of the East Kauai Water Users Cooperative, testified they are a
- non-profit water cooperative started in 2000. They received a revocable permit to operate
- the former East Kauai Irrigation System from the Department of Land & Natural
- Resources (DLNR) who has jurisdiction over the system. This entity (Green Energy)
- signed an agreement with KIUC and does not have the resources to fulfill their
- commitment. They are now coming before you asking for prime agricultural land. The
- applicant, the farmers and the East Kauai Water Users Cooperative are the three parties
- involved. When they entered into the agreement with the Department the plan was to
- derive revenues off of these Kalepa lands. If it was fully planted out the revenues would
- be $120,000 a year. He presented the Kalepa Agricultural Master Plan which was
- commissioned by DLNR since February 2003. It has no provision for production of
- biomass on these State Lands. These are the best agricultural lands on East Kauai and if
- they are taken out the Cooperative will not survive. When the Coop entered into this agreement assuming they would have these lands as a source of revenue. He suggested transferring these lands to the ADC and proceed in an orderly planned manner. He asked
- the Board to take everything into consideration and to reject the proposal.
- Member Johns asked what was wrong with the coop approach. Is there anyway

Ranchers suddenly find themselves competing for ranchlands

- HONOLULU – Members of the Hawaii State Senate Committee on Water, Land, Agriculture and Hawaiian Affairs will conduct an informational briefing and public hearing in Hilo on Wednesday, December 17, 2008 at 5:00 p.m. at the University of Hawaii-Hilo, UCB Room 127.The meeting will focus on Hawai‘i Revised Statutes section 171-95 (as amended in Act 102, Session Laws of Hawai‘i 2002) regarding an expedited process for alternative energy development and the subsequent action taken by the Board of Land and Natural Resources at their meeting held on Friday, November 14, 2008 in Honolulu. A probable outcome of the meeting may be proposing amendments to HRS sec. 171-95—which relates in part to the granting of leases to renewable energy producers without public auction—to allow other alternative energy entities to participate in a process prior to selection, to provide better public notification of pending applications, and to hold the decision-making meeting on the island where the project is proposed to occur.

Opportunity -Agriculture residues

- **Macadamia Nut Husks - Big Island**
- In 1982, Mauna Loa Macadamia Nut Corporation, a C. Brewer company, installed a boiler in their nut processing plant near Hilo on the Big Island that was capable of using macadamia nut husks as a fuel. This boiler provided process heat to the factory and is also used to power a 750kW generator that provides electricity to the facility. This electricity is not sold to the electric utility. C. Brewer does not disclose the volume of the macadamia nut husks it burns annually in this facility, or the electricity it generates.

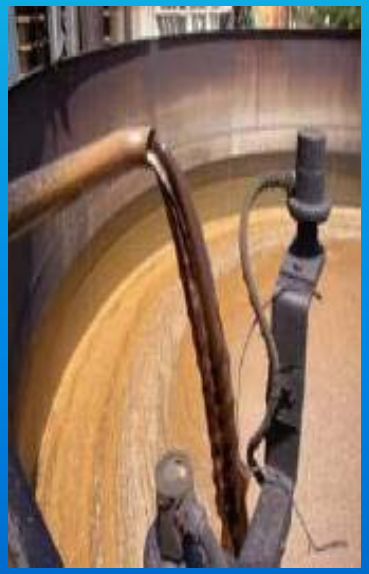
Opportunity – Agricultural wastes

- **Happy Hula Hog Farm, Kula, Maui (No Longer in Operation)**
- This **hog farm utilizes farm hog manure to generate electrical energy to operate**
- **agricultural equipment**. For over a decade, the owner of this farm **has operated a biomass digester to produce biogas**. Since 1991, this biogas has been used in a system that turns this gas into electricity. The facility used a 20 kW generator that operates daily for 8 to 10 hours, as it does not produce enough biogas to power the farm 24 hours per day.

Complement NOT Replace

Sugarcane Model

- No waste in the system – all parts used
- Energy = coproduct to a higher value production system (sugars, molasses)



Complement NOT Replace

- Livestock carcasses
- Livestock/poultry waste
- Other agri-residues

User of Co-products

- Fertilizer
  - Nitrogen, Phosphorus, Potassium
  - Requirements
    - Affordable
    - User friendly form
    - Transportable
- Currently $100+ /ton for transportation
- Goal – cost equivalent to mainland farmers

Ranchers/Aquaculture/Poultry need feed

- Currently majority of aquaculture/poultry feed is imported
- Cattle (dairy and beef) trying to wean themselves off of imports but need to address dry periods

Mahalo

- If the farmer makes money, the farmer will farm (farmer Richard Ha)
- Biofuels should not replace active agricultural operations
- Smaller farms and ranchers complement Biofuel Industry as users of coproducts